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ABSTRACT

Pupil activity was observed in three Title I projects to determine the frequency of certain essential activity categories, to compare those frequencies with the supervisors' ideal, to assess relationships between pupil activity and achievement, and between implementation and achievement, and to compare supervisor ratings of implementation with observed implementation. Results indicated that pupil activity frequencies were different among the 13 to 37 sites within projects, that achievement varied significantly between sites, that there was no consistent relationship between pupil activity variables and achievement, and that neither measure of project implementation was related to achievement. Recommendations for future research are made. (Author)

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# PROGRAM IMPLEMENTATION AND PUPIL ACHIEVEMENT IN THREE TITLE I PROJECTS

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Objectives

Product evaluations for three Title I elementary school projects in reading and mathematics had indicated for several years that the projects had been successful in raising pupil achievement; however, there had been no careful description of the procedure which had been used during the 3-5 years of the projects' operation. The present study was conducted in order to (1) develop a description of pupil activities in each project (2) test whether the implementation of pupil activities matched the "ideal" of project supervisors (3) determine whether the frequencies of certain pupil activities were related to achievement at each site (4) determine whether the degree of implementation to the supervisors' ideal were related to achievement, and (5) test whether supervisors' ratings of site implementation were related to achievement or observed implementation.

Perspectives

The rationale of other program implementation studies (Stallings and Kaskowitz, Siegel) was invoked here. The successful product evaluations led to questions regarding explanation of the observed achievement gains. What was happening to these low achieving inner city children in the project classrooms that might help to explain their achievement gains? Was achievement consistent among the 15 to 41 sites within each project? Was implementation of the project consistent?

The call for the step beyond description in teacher behavior studies (Rosenshine) was heeded when questions regarding the effect of particular aspects of implementation were raised. Were some aspects of implementation more strongly related to achievement than others? What was the relationship between implementation to the ideal of the supervisors and achievement?

Pupil activity was chosen as the specific component of project implementation to be studied. The rationale for that choice was based upon several

considerations. First, pupil activity was one of few aspects of the project allowed to vary. Staff, materials, instructional time and content were quite consistent within projects. Second, the model of learning which was used was that in which the response of the learner to the instructional setting is essential. (Anderson and Faust) Third, research literature had shown that some pupil activity variables were related to achievement. (McDonald, Stallings) Finally, low inference, objective observation of pupil activity was not objectionable to project staffs, but other types of observation were threatening to them and cooperation would have been difficult to attain.

Methods

Descriptions of essential components of project implementation in terms of pupil activity were developed from project descriptions in the proposals for funding, observation of classroom activity and discussion with project teachers and supervisors. Then supervisors assigned to essential component categories a frequency with which the activity would be observed in a perfectly implemented classroom.

A direct observation system called the Pupil Activity Profile was developed with four nonverbal dimensions - purpose of activity, group size, specific activity and interacting agent. Each dimension had between three and eight categories. Individual pupils were observed using a time sampling technique. Four observers were trained, their interobserver reliability was checked and deemed satisfactory at .76 for taped observation and .87 for live observation. Each site was observed twice, each time by a different observer. The mean of the two observations for each category became the independent variables.

Achievement measures were the adjusted site mean scores on standardized test subtests related to the content of the project (reading or mathematics).

Supervisors rated each site on a five point scale for the degree to which each site implemented the project as they believed it should have been implemented. Observed implementation scores were developed by summing scores for

each category weighted for their proximity to the ideal frequency.

Project mean pupil activity frequencies were compared to supervisors' ideal mean frequencies by means of t-tests. In order to determine whether significant variance existed between sites in pupil achievement to make interpretation of correlations reasonable, and to obtain mean scores adjusted for pretest achievement, analyses of covariance were conducted with posttest as criterion and pretest as adjuster. The observation data was analyzed for normality of distribution. Where the data were usable, Pearson product-moment correlation coefficients were computed between site observation frequencies in certain categories of pupil activity which other research and literature had indicated might be related to achievement and the site adjusted mean achievement at each grade level. The correlations between total implementation scores and achievement, and between supervisor ratings of implementation and achievement were also computed.

Results and Conclusions

All general hypotheses were rejected. Less than half of the categories chosen by supervisors as essential components of project implementation were observed to be implemented with the "ideal" frequency.

Table 1 shows the percent of observations which included a code for each activity. The percentages do not sum to 100 even with a dimension, since the categories are not mutually exclusive and multiple coding was possible for each pupil. The dimensions of purpose and group size were most frequently observed to be implemented, according to the supervisors' ideal. The HILL Reading Project was most closely implemented to the supervisors' ideal.

The analysis of covariance results demonstrated that there was significant between-site variance in all three projects at all grade levels except kindergarten mathematics.

The number of significant correlations between pupil activity frequencies and achievement (five of sity-one) was at the chance level, and there was no

discernible trend, even in the direction of the correlations, within projects or within grade levels.

Table 2 shows the correlations found between achievement and activity. Four of the five significant correlations appeared in the mathematics project. Two of them showed a positive relationship between handling and math achievement at first grade. The other two were negative correlations at fourth grade. The proportion of instructional activity (compared to management of other activity) was negatively related to achievement, as was speaking and listening acitivity.

The same, almost random appearing results were found in the correlations between implementation scores and achievement and between supervisor ratings of implementation and achievement.

Table 3 shows one significant correlation between achievement and implementation to the supervisors' ideal - a negative correlation at Grade Three in one reading project. There were two significant correlations between supervisor rating and achievement - both positive - at Grade 3 in HILL Reading and Grade 1 in mathematics. Additionally, there was a sizable positive correlation between achievement and supervisor rating at second grade in the HILL reading and positive correlations reaching the .85 significance level in mathematics at Grades Two and Three.

It was concluded that (1) there was no consistent pattern of implementation among sites within projects, at least within the limited observation period of this study (2) achievement varied significantly between sites. (3) frequency of pupil activity variables that had been found to be positively related to pupil achievement in other studies did not have a consistent relationship with achievement in this study with its own observation method and population (4) implementation of pupil activity variables to the supervisors' ideal frequencies was not consistently related to achievement and (5) supervisors' high inference ratings of achievement were somewhat better predictors of achievement than the observation variables.

Implications

Related to the findings above, the implications of the study are: (1) Although labeled a single project, if there are considerable differences in implementation of pupil activities among sites, then achievement gains cannot be attributed to the project, but to individual sites. The project cannot be exported, as no single pattern of implementation can be described for use by others. (2) Further study of procedures used by project sites with high or low achievement is recommended. (3) The Title I population in this study may not respond to the same instructional variables as other pupil populations. Further study of those variables positively related to achievement in other studies is recommended. (4) Supervisors and program developers should reconsider their preferences for particular patterns of instructional activity by examining their rationale in the light of research findings. (5) The actual criteria which supervisors use in assigning high inference ratings of implementation to sites should be examined for possible variables for further research.

The procedures followed in this study are applicable to many instructional programs. The information regarding the activity and achievement of each site is useful for effective supervision. However, in the pursuit of instructional variables related to learning, the movement in teacher behavior studies away from the relatively simple correlational model to the more complex, multivariate trait-treatment interaction studies should direct further research in this area.

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TABLE 1

Actual and Ideal Percents of Total Observations in Which Pupils Were Engaged in Essential Categories of Pupil Activity in Three Title I Projects

| Supervisor Designated Essential Component Pupil Activity Categories | PROJECT | | | | | |
|---|---|---|---|---|---|---|
| | Reading Center | | HILL Reading | | Mathematics | |
| | Ideal | Actual | Ideal | Actual | Ideal | Actual |
| Purpose of Activity | | | | | | |
| Instructional | 88.0 | 82.1 | 76.0 | 75.6* | 95.0 | 94.3* |
| Management | 12.3 | 17.8 | 22.3 | 23.0* | | |
| Group Size | | | | | | |
| Independent | 24.7 | 25.8* | 53.3 | 51.6* | | |
| One-to-one | 20.0 | 20.6* | 20.0 | 21.9* | 20.0 | 13.4 |
| Small group | 24.3 | 18.5* | 17.7 | 20.9* | 75.0 | 91.7 |
| Full group | 27.7 | 41.1 | 9.0 | 11.5* | | |
| Activity | | | | | | |
| Reading | 46.7 | 67.5 | 46.7 | 63.1 | 20.0 | 69.7 |
| Writing | 10.0 | 13.7 | 13.3 | 19.8 | 20.0 | 26.4 |
| Speaking | 26.7 | 45.8 | 11.7 | 33.8 | 20.0 | 50.7 |
| Listening | 33.3 | 74.1 | 26.7 | 47.6 | 80.0 | 85.7 |
| Watching | 6.7 | 25.9 | 6.7 | 17.5 | 50.0 | 49.0* |
| Handling | | | | | 20.0 | 40.9 |
| Interacting Agent | | | | | | |
| Teacher | 26.7 | 52.9 | 21.7 | 22.1* | 25.0 | 25.4* |
| Aide | .7 | 15.1 | 13.3 | 16.5* | 50.0 | 60.2 |
| Pupil | 15.0 | 30.0 | 10.0 | 17.3 | 25.0 | 43.3 |
| Instructional Media | 50.0 | 80.1 | 60.0 | 80.5 | 50.0 | 90.2 |
| Essential Combinations of Categories | | | | | | |
| One-to-one/Teacher or Aide | 20.0 | 14.0 | 30.0 | 14.7 | 25.0 | 12.9 |
| Small group/Teacher or Aide | 26.7 | 12.1 | 20.0 | 8.8 | | |
| Small group/Listening | 15.0 | 7.5 | 10.0 | 12.3* | | |
| Independent/Reading | 40.0 | 17.5 | 21.0 | 35.8 | | |
| Reading/Writing | 10.0 | 11.9* | 20.0 | 19.0* | 10.0 | 26.1 |
| Reading/Listening | 13.3 | 47.0 | 20.0 | 26.7 | 5.0 | 57.3 |
| Speaking/Listening | 10.0 | 33.2 | 10.0 | 14.8 | 25.0 | 45.9 |
| Listening/Watching | 13.3 | 18.8 | 20.0 | 8.7 | 50.0 | 44.9 |
| Listening/Pupil | 10.0 | 23.8 | 10.0 | 7.7* | 25.0 | 39.7 |

* difference was not significant (t value with $p > .05$)

Note: Percentages do not sum to 100% because of multiple coding of each pupil.

TABLE 2

Correlations Between Certain Pupil Activity Frequencies
and Adjusted Site Mean Achievement in Three Title I Projects

| Category of Pupil Activity Hypothesized to be Related to Achievement | PROJECT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Reading Center | | | HILL Reading | | | Mathematics | | | |
| GRADE | Two | Three | Four | Two | Three | Four | One | Two | Three | Four |
| N(Sites) | 26 | 25 | 18 | 6 | 13 | 10 | 25 | 33 | 33 | 33 |
| Total Instructional | -.28 | .42* | -.35 | .25 | -.16 | .03 | .12 | .14 | -.07 | -.36* |
| I Independent Reading | NT | NT | NT | .18 | .06 | .09 | | | | |
| Total I Reading | .14 | -.02 | .14 | .05 | .16 | .16 | | | | |
| I One-to-one/Teacher or Aide | -.11 | -.18 | .19 | .14 | -.11 | .08 | .06 | -.25 | .12 | .08 |
| I Reading/Writing | NT | NT | NT | .17 | -.28 | -.16 | .03 | -.09 | .06 | .10 |
| I Reading/Speaking | -.05 | .22 | .11 | .32 | -.12 | .24 | | | | |
| I Reading/Listening | .05 | .03 | -.23 | -.49 | .20 | .17 | | | | |
| I Reading/Handling | | | | | | | .35* | .05 | .10 | .01 |
| I Listening/Speaking | | | | | | | .11 | -.18 | .06 | -.50* |
| I Listening/Watching | | | | | | | .22 | .16 | -.13 | .08 |
| I Listening/Handling | | | | | | | .38* | .03 | .09 | .13 |

* $p < .10$

NT = not tested due to non-normal distribution of dependent variable

TABLE 3

Correlation Coefficients Between Adjusted Site Mean Achievement, Observed Implementation and Supervisor Rating of Implementation in Three Title I Projects

| Project | Grade Level | Achievement and Observed Implementation | | | | Achievement and Supervisor Rating of Site Implementation | | | | Observed Implementation and Supervisor Rating |
|---|---|---|---|---|---|---|---|---|---|---|
| | | One | Two | Three | Four | One | Two | Three | Four | |
| Reading Center | | | .23 | -.38* | .38 | | .05 | -.05 | .03 | .07 |
| | N= | | 26 | 25 | 18 | | 26 | 25 | 18 | 41 |
| HILL Reading | | | .09 | -.17 | -.25 | | .49 | .56* | -.10 | -.14 |
| | N= | | 6 | 13 | 10 | | 6 | 13 | 10 | 13 |
| Mathematics | | -.16 | .01 | .00 | .17 | .36 | .28 | .26 | .06 | -.02 |
| | N= | 25 | 33 | 33 | 33 | 25 | 33 | 33 | 33 | 37 |

* $p < .10$